

## EDITORS

ERRY YULIAN TRIBLAS ADESTA

MOHAMMAD YEAKUB ALI

AKM NURUL AMIN

# DESIGN FOR MANUFACTURE

Towards Improved Manufacturability



**IIUM Press**

# DESIGN FOR MANUFACTURE

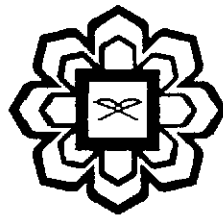
## Towards Improved Manufacturability

### EDITORS

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# CONTENTS

## Preface

---

## PART I: DESIGN

---

### Chapter 1 - Design of a Simple and Affordable Electric Bicycle ..... 04

Tasnim Firdaus Ariff<sup>1</sup>, Goey Ewing<sup>2</sup> and Kam Yee Wah<sup>3</sup>  
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---

### Chapter 2 - Design of Bicycle Helmet Using FEA ..... 10

Tasnim Firdaus Ariff<sup>1</sup> and Lau Ken Tick<sup>2</sup>  
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2 School of Technology, Tunku Abdul Rahman College  
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---

### Chapter 3 - Mould Design for Handphone Casing Using Moldflow ..... 18

Tasnim Firdaus Ariff<sup>1</sup> and Law Siah Yong<sup>2</sup>  
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2 School of Technology, Tunku Abdul Rahman College  
✉ : [tasnim@iium.edu.my](mailto:tasnim@iium.edu.my)

---

### Chapter 4 - Improvement of Typical Hip-Joint Design for Gripping and Fixing ..... 26

Siti Norbadiyah Binti Mohamad Badari<sup>1</sup> and Erry Adesta<sup>2</sup>  
1, 2. Faculty of Engineering – International Islamic University Malaysia  
✉ : [eadesta@iium.edu.my](mailto:eadesta@iium.edu.my)

---

### Chapter 5 - A Surgical Training Model Manufacture Using Fused Deposition Modeling ..... 44

Hasanudin Hafis Mohamad Ali, Md. Amir Hamzah Md. Shukri, WAY Yusoff  
Faculty of Engineering – International Islamic University Malaysia  
✉ : [hasan.ma86@gmail.com](mailto:hasan.ma86@gmail.com); [mdamirhamzah87@gmail.com](mailto:mdamirhamzah87@gmail.com)

---

**Chapter 6 - Reverse Engineering for Rapid Prototyping of Automotive Components ..... 50**

WAY Yusoff<sup>1</sup>, Muhammad Ridhuan Kamarudin<sup>2</sup> and Noor Hiana Mohd Salimi<sup>3</sup>  
1, 2, 3 Faculty of Engineering – International Islamic University Malaysia  
✉ : yusmawiza@iium.edu.my; wan\_ching05@yahoo.com.my; nuriliana@yahoo.com

---

**Chapter 7 - Design and Fabrication of Industrial Welding Robotic Arm ..... 58**

Syed Idros Syed Abdullah<sup>1</sup>, Mohamad Syatbi Mahamad Puzi<sup>2</sup>, and WAY Yusoff<sup>3</sup>  
1,2,3. Faculty of Engineering – International Islamic University Malaysia  
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---

---

**PART II: QUALITY**

---

**Chapter 8 - Application of Statistical Quality Control for Quality Improvement ..... 66**

Tasnim Firdaus Ariff<sup>1</sup> and Yap Yee Seng<sup>2</sup>  
1 Faculty of Engineering – International Islamic University Malaysia  
2 School of Technology, Tunku Abdul Rahman College  
✉ : tasnim@iium.edu.my

---

**Chapter 9 - The Development of Cost Estimation for Quality Assurance System in Die-Casting Processes ..... 72**

Nur Hanisah A Hamzah<sup>1</sup> Nurhafizah Azmi<sup>2</sup> and Erry Yulian Tribblas Adesta<sup>3</sup>  
1, 2, 3 Faculty of Engineering, International Islamic University Malaysia  
✉ : eadesta@iium.edu.my

---

**Chapter 10 - Study the Adherence of the Values in The ISO 9001:2000 Certified Companies in Malaysia ..... 84**

Dr. Mohd Radzi Bin Haji Che Daud<sup>1</sup> and Rusdi Bin Mat Song<sup>2</sup>  
1, 2. Faculty of Engineering – International Islamic University Malaysia

---

**Chapter 11 - Cost Comparison Analysis between Strip to Coil for Support Brake Pedal at Suria Component (M) Sdn. Bhd ..... 92**

Dr. Mohd Radzi Bin Haji Che Daud<sup>1</sup>, Shamin Asyrani Bt Alies<sup>2</sup>, Norhayati Bt Saleh<sup>3</sup>  
1,2,3. Faculty of Engineering – International Islamic University Malaysia

**Chapter 12 - Performance Measurement of SMEs Manufacturing Sector in Malaysia ..... 98**

WAY Yusoff<sup>1</sup>, Muhammad Fauzan Md Noraini<sup>2</sup> and Mohd Norazrul Ismail<sup>3</sup>  
1, 2, 3 Faculty of Engineering - International Islamic University Malaysia  
✉ : yusmawiza@iium.edu.my

---

**Chapter 13 - The Introduction of Fit Manufacturing as a Performance Measuring Approach towards Sustainability of Selected Manufacturing Companies in Malaysia ..... 105**

WAY Yusoff<sup>1</sup>, Aziatul Ashikin Mohd<sup>2</sup> and Siti Maznah Abdul Rahim<sup>3</sup>  
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✉ : yusmawiza@iium.edu.my

---

**Chapter 14 - The Study of the Implementation of OHSAS: 18001 at Kulliyyah of Engineering ..... 113**

WAY Yusoff<sup>1</sup>, Muhammad Fakhrani Hayyun<sup>2</sup> and Mohd Fairus bin Abdullah<sup>3</sup>  
1, 2, 3 Faculty of Engineering - International Islamic University Malaysia  
✉ : yusmawiza@iium.edu.my

---

**Chapter 15 - Implementation of FMECA on Fixed Assembly Cell (FAC) ..... 121**

WAY Yusoff<sup>1</sup> and Paul Roberts<sup>2</sup>  
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---

**Chapter 16 - Implementation of FMECA on Computer Integrated Manufacturing (CIM) ..... 129**

WAY Yusoff<sup>1</sup> and Azmil Soleh<sup>2</sup>  
1,2 Faculty of Engineering – International Islamic University Malaysia  
✉ : yusmawiza@iium.edu.my

---

---

## **PART III: MATERIALS**

---

**Chapter 17 - The Effect of Stucco System in Ceramic Shell Investment Casting ..... 139**

Siti Norbahiyah Binti Mohamad Badari<sup>1</sup> and Erry Adesta<sup>2</sup>  
1, 2. Faculty of Engineering – International Islamic University Malaysia  
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---

**Chapter 18 - Casting Investigation of Heat Treated Biocompatible Materials  
for Total Hip Bone Replacement ..... 151**

Siti Norbahiyah Binti Mohamad Badari<sup>1</sup> and Erry Adesta<sup>2</sup>  
1, 2. Faculty of Engineering – International Islamic University Malaysia  
✉ : [eadesta@iium.edu.my](mailto:eadesta@iium.edu.my)

---

**Chapter 19 - Pultrusion of Pineapple Leaf Fibre (PALF)-reinforced Vinyl Ester  
Composites: Water Absorption Property ..... 162**

Mohamed Abd. Rahman, M. Kamarul Helmi M. Nawawi  
Faculty of Engineering – International Islamic University Malaysia  
✉ : [mrahman@iium.edu.my](mailto:mrahman@iium.edu.my)

---

**Chapter 20 - Effects of Austempering Treatment on Mechanical Properties of  
Ductile Iron ..... 170**

Belal Ahmed Ghazal<sup>1</sup> and Erry Yulian Triblas Adesta<sup>2</sup>  
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---

**Chapter 21 - Microwave Sintering of Metallic Materials ..... 179**

Tasnim Firdaus Ariff  
Faculty of Engineering – International Islamic University Malaysia  
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---

**Chapter 22 - Microwave Sintering of Ceramic Materials ..... 185**

Tasnim Firdaus Ariff  
Faculty of Engineering – International Islamic University Malaysia  
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---

---

## **PART IV: MODELLING**

---

**Chapter 23 - Numerical Analysis to Characterize Triaxiality Value of Adhesive Joint  
due to Particular Load Configuration. Part 1: Butt Joint ..... 194**

Irfan Hilmy  
MME Dept., Faculty of Engineering – International Islamic University Malaysia  
✉ : [ihilmy@iium.edu.my](mailto:ihilmy@iium.edu.my)

**Chapter 24 - Numerical Analysis to Characterize Triaxiality Value of Adhesive Joint due to particular Load Configuration. Part 2: Cleavage and Scarf Joint ..... 202**

Irfan Hilmy  
Faculty of Engineering – International Islamic University Malaysia  
✉ : [ihilmy@iium.edu.my](mailto:ihilmy@iium.edu.my)

**Chapter 25 - Metabolic Energy of Manual Lifting in Manufacturing Industry ..... 213**

Mohammad Iqbal<sup>1</sup>  
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---

**PART V: MANAGEMENT**

---

**Chapter 26 - Value Stream Mapping: an Important Footstep for Value Analysis and Value Engineering ..... 223**

A. N. Mustafizul Karim and Nurul Husna Binti Azon  
Faculty of Engineering, International Islamic University Malaysia  
Email: [mustafizul@iium.edu.my](mailto:mustafizul@iium.edu.my)

**Chapter 27 - The Project Management Challenges in Technology Innovation ..... 231**

Mahmood Hameed Mahmood<sup>1</sup> and Erry Yulian Triblas Adesta<sup>2</sup>  
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**Chapter 28 - Critical Chain in Project Management ..... 239**

Erry Yulian Triblas Adesta<sup>1</sup>, Asfana Banu Mohamad Asharaf<sup>2</sup>, Nur Atiqah Abdul Rahman Azmil<sup>3</sup>  
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---

**PART VI: MACHINING**

---

**Chapter 29 - Engineering Project Management in Automotive Industry ..... 247**

Mohamed Konneh<sup>1</sup>, and Abdul Halim  
Faculty of Engineering - International Islamic University Malaysia



**Chapter 30 - Surface Study when Finish Grinding Silicon using Resin Bonded Diamond Cup Wheel..... 257**

Mohamed Konneh<sup>1</sup>, and Muhammad Mukhtar  
Faculty of Engineering, International Islamic University Malaysia  
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---

**Chapter 31 – Surface Roughness Studies in Die-sink EDM of Tungsten Carbide using Copper Tungsten Electrode ..... 264**

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---

**Chapter 32 – Study of the Effect of different Electrodes on Material Removal Rate, Electrode Wear Rate and Surface Roughness in the EDM of S-STAR ..... 272**

Mohamed Konneh<sup>1</sup>, Nur Jannah Shad and Noor Fazlin Saharudin  
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✉: mkonneh@iium.edu.my

---

**Chapter 33 – Kerf in Micro Wire Electro Discharge Machining ..... 279**

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---

**Chapter 34 - The Effect of Deep Cryogenic Treatment on the Properties of AISI D2 Tool Steel ..... 286**

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**Chapter 35 - Effect of Welding Process on Formability of Tailor Welded Blanks ..... 294**

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---

**Chapter 30 Surface Roughness Studies in Die-sink EDM of Tungsten Carbide using Copper Tungsten Electrode ..... 257**

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---

**Chapter 31 - Study of the Effect of different Electrodes on Material Removal Rate, Electrode Wear Rate and Surface Roughness in the EDM of S-STAR..... 264**

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---

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**Chapter 33 - Engineering Project Management in Automotive Industry ..... 279**

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## **The Effect of Stucco System in Ceramic Shell Investment Casting**

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### **1. Introduction**

Investment casting method is preferred in fabricating hip-bone. Investment casting yields a finely detailed and accurate product, with excellent metallurgical properties (Banga, 2007). Moreover, intricate shapes can be made with high accuracy (Ramana Rao, 2003).

Ceramic shell development is one of the most important procedures in investment casting. There is no proper rule for repetitive procedure of making layers and drying the ceramic shell in order to achieve appropriate thickness and strength (Beeley and Smart, 1995). Therefore, this study may benefit a lot in terms of cost reduction and time saving while promising a better quality of the product.

Thus, an attempt has been made in this study to prepare an acrylic die halves as part of the investment casting process.

### **2. Literature Review**

#### **2.1 Application of Investment Casting In Total Hip Replacement**

Investment casting is also known as lost-wax casting. Basically, in investment casting process, ceramic slurry is applied all around the surface area of a disposable pattern and allowed to dry and harden to become a disposable casting mold.

Due to technological advances, ceramic shell investment casting process has sustained continued development and become the most versatile modern metal casting technique. Ceramic shell moulds are used primarily for investment casting of carbon and alloy steels, stainless steels, heat resistant alloys, and other alloys with melting points above 1087°C. Ceramic moulds with very low green strengths are prone to crack during wax removal. The raw materials (refractory, binder, wetting agent, and antifoam) used to make slurry play a major role in determining the overall final ceramic